

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Aircraft Alighting Gear

We, DOWTY ROTOL LIMITED, a British Company of Arle Court, Cheltenham, in the County of Gloucester, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to aircraft alighting gear.

It is known to mount two or more aircraft landing wheels upon a frame on two axes situated one behind the other. Such arrangement is hereinafter referred to as "a bogie". The bogie is usually carried by an aircraft supporting leg, this combination forming an element of an aircraft alighting gear.

Instead of a bogie, the aircraft supporting leg may carry an endless track arrangement, hereinafter referred to as "an endless track", to enable the aircraft to operate from uneven terrain.

Such alighting gear is usually retractable into the fuselage, nacelle or wing of the aircraft.

According to the invention, an aircraft alighting gear includes a bogie or endless track, a supporting leg pivotally attachable, at or near one end portion, to the aircraft so that it can be retracted from an extended condition, the leg being pivotally attached at or near its other end portion to the bogie or endless track, and a compound linkage for effecting correct positioning of the bogie or endless track for stowage during retraction, the compound linkage being pivotally connected at or near one end portion directly to the bogie or endless track, being pivotally connected at an intermediate point to the supporting leg and being pivotally attachable at or near its other end portion through a lost-motion-type of connection to the aircraft, so that when the alighting gear is fitted to the aircraft and is extended, the arrangement of the compound linkage and its lost-motion-type of connection ensures that no landing loads will be transmitted to the aircraft from the ground through the point of attachment of the compound linkage to the aircraft.

[Price 4s. 6d.]

One embodiment of the invention will now be particularly described with reference to the accompanying drawings, of which,

Figure 1 is a side elevation of an aircraft alighting gear, and,

Figure 2 is an end elevation of the aircraft alighting gear.

Referring to the drawings, a single supporting leg 11 which is of the two-part telescopic type and which incorporates shock-absorbing means (not shown), near its upper end in the drawing, is pivotally attached about an axis 12 to the structure of an associated aircraft, part of the fuselage of which is shown at 13 in Figure 2. Near its other end, that is the lower end in the drawing, the supporting leg 11 is pivotally attached at 14 to a point on a bogie 15. The bogie 15 is provided with two axes 16 and 17 respectively positioned forward and rearward of the pivotal attachment 14, and each carrying a landing wheel 18. The pivotal attachment 14 is positioned equidistant from the rotational axes of the forward and rearward wheels 18 of the bogie.

The arrangement is such that the supporting leg 11, together with the bogie 15, can be retracted upwardly and forwardly with respect to the aircraft 13 about the pivotal axis 12 of attachment of the supporting leg to the aircraft. For this purpose a fluid-pressure-operated retraction jack 19 is pivotally connected between a point on the structure of the aircraft 13 and a crank arm 20 formed integrally with a boss 21 fast with respect to the supporting leg 11 and arranged co-axially with respect to the pivot axis 12 of the supporting leg. A bell crank lever 22 is pivotally mounted at 23 at the junction of its two arms 22a and 22b upon the supporting leg 11, the point of the mounting 23 being positioned intermediate the ends of that part of the telescopic

leg which is pivotally connected to the aircraft. The axis of the pivotal mounting 23 is parallel with the rotational axes of the wheels 18. A telescopic strut 24 is pivotally connected at 25, near one end, to the arm 22b of the bell crank lever 22, while near its opposite end this strut 24 is pivotally connected to the bogie 15 at a point 26 upon the frame of the bogie, which point lies on the rotational axis of the front wheel 18. Both the telescopic supporting leg 11 and the telescopic strut 24 each carry a stop (not shown) mounted internally to limit their extension. Further, the supporting leg 11 is provided with a conventional scissors linkage 27 connecting the telescoping parts thereof. A tie member 28 is pivotally connected at 29 near one end to the arm 22a of the bell crank lever 22, while near its other end this tie member is pivotally connected to a part of the aircraft structure by means of a pin 30, which engages a slot 31 in the tie member to afford a small amount of axial movement of the tie member relative to the pin.

The bell crank lever 22, the telescopic strut 24 and the tie member 28 together form a mechanism hereinafter referred to as "the compound linkage".

The aircraft 13 is provided with a stowage bay 32 for the alighting gear. This stowage bay is situated on the lower side of the aircraft fuselage.

Brake torque compensating links 33 and 34 are provided in known operable association with the brakes of the wheels 18, these links being pivotally connected with the lower end portion of the leg 11.

Further, an up-lock mechanism (not shown) and a down-lock mechanism 35 are provided in association with the leg 11.

In operation, when it is desired to retract the supporting leg 11 and bogie 15, the down-lock mechanism 35 is released and at the same time fluid under pressure is admitted to the retraction jack 19 so as to extend it. This extension causes the supporting leg 11 to swing forwardly and upwardly about its pivot axis 12, while the compound linkage operates angularly to displace the bogie 15 with respect to the supporting leg 11 about its pivotal connection 14 therewith. In this way upon completion of the retraction movement, the bogie 15 is correctly positioned for stowage in the storage bay 32 of the aircraft 13. The retracted position of the components of the alighting gear is shown in broken lines in both Figure 1 and Figure 2. The compound linkage is arranged such that when the alighting gear is extended and the aircraft 13 is landing, no landing loads are transmitted from the ground to the aircraft structure through the pin 30 which forms the point of connection of the compound linkage with the aircraft.

The provision of the slot 31 in the tie member 28 is to ensure that deflections of the bogie 15 upon landing, which may be transmitted to the compound linkage, are not transmitted to the aircraft structure.

With the compound linkage herein described, the bogie 15 is maintained at a constant or substantially constant angular relationship with respect to the aircraft 13 during the entire retraction movement. Alternatively however, the dimensions of the components of the alighting gear may be chosen such that the bogie 15 may be caused to follow a desired trajectory to avoid structural components in its retraction movement.

In an alternative embodiment of the invention the compound linkage described above may alternatively be used with an endless track arrangement.

WHAT WE CLAIM IS:—

1. An aircraft alighting gear including a bogie or endless track, a supporting leg pivotally attachable, at or near one end portion, to the aircraft so that it can be retracted from an extended condition, the leg being pivotally attached at or near its other end portion to the bogie or endless track, and a compound linkage for effecting correct positioning of the bogie or endless track for stowage during retraction, the compound linkage being pivotally connected at or near one end portion directly to the bogie or endless track, being pivotally connected at an intermediate point to the supporting leg and being pivotally attachable at or near its other end portion through a lost-motion-type of connection to the aircraft, so that when the alighting gear is fitted to the aircraft and is extended, the arrangement of the compound linkage and its lost-motion-type of connection ensures that no landing loads will be transmitted to the aircraft from the ground through the point of attachment of the compound linkage to the aircraft.

2. An alighting gear as claimed in Claim 1, wherein the compound linkage comprises a bell-crank lever pivotally mounted upon the supporting leg, a strut pivotally connected at or near one end portion to one arm of the bell-crank lever and at or near its other end portion directly to the bogie or endless track, and a tie member pivotally connected at or near one end portion to the other arm of the bell-crank lever and pivotally attachable at or near its other end portion through the said lost-motion-type of connection to the aircraft.

3. An alighting gear as claimed in Claim 2, wherein the supporting leg is a telescopic leg and the strut is a telescopic strut.

4. An alighting gear substantially as hereinbefore particularly described with reference to the accompanying drawings.

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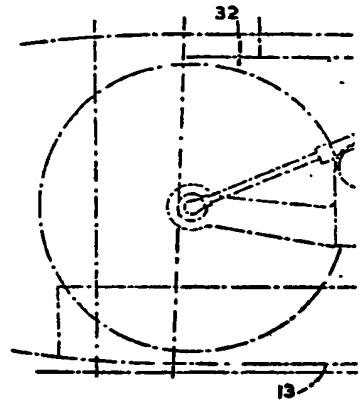
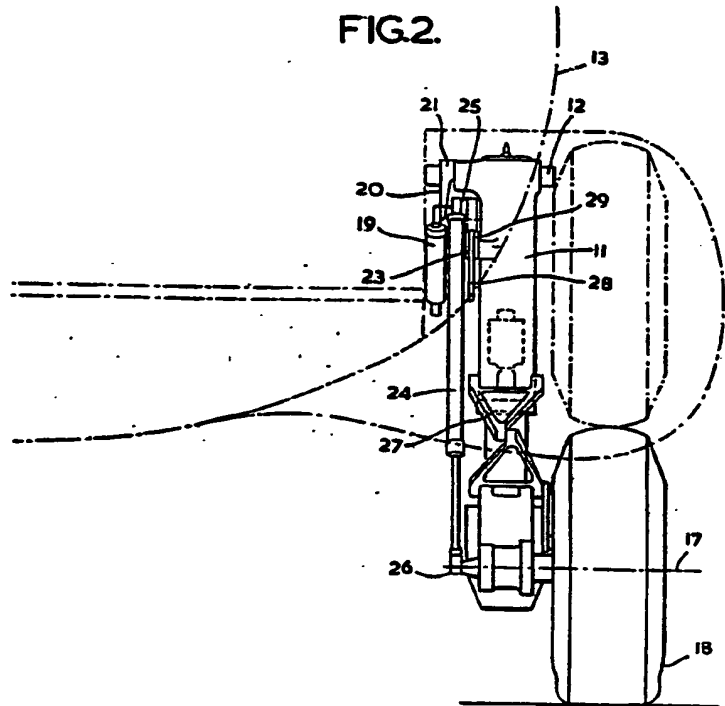


FIG. 2.

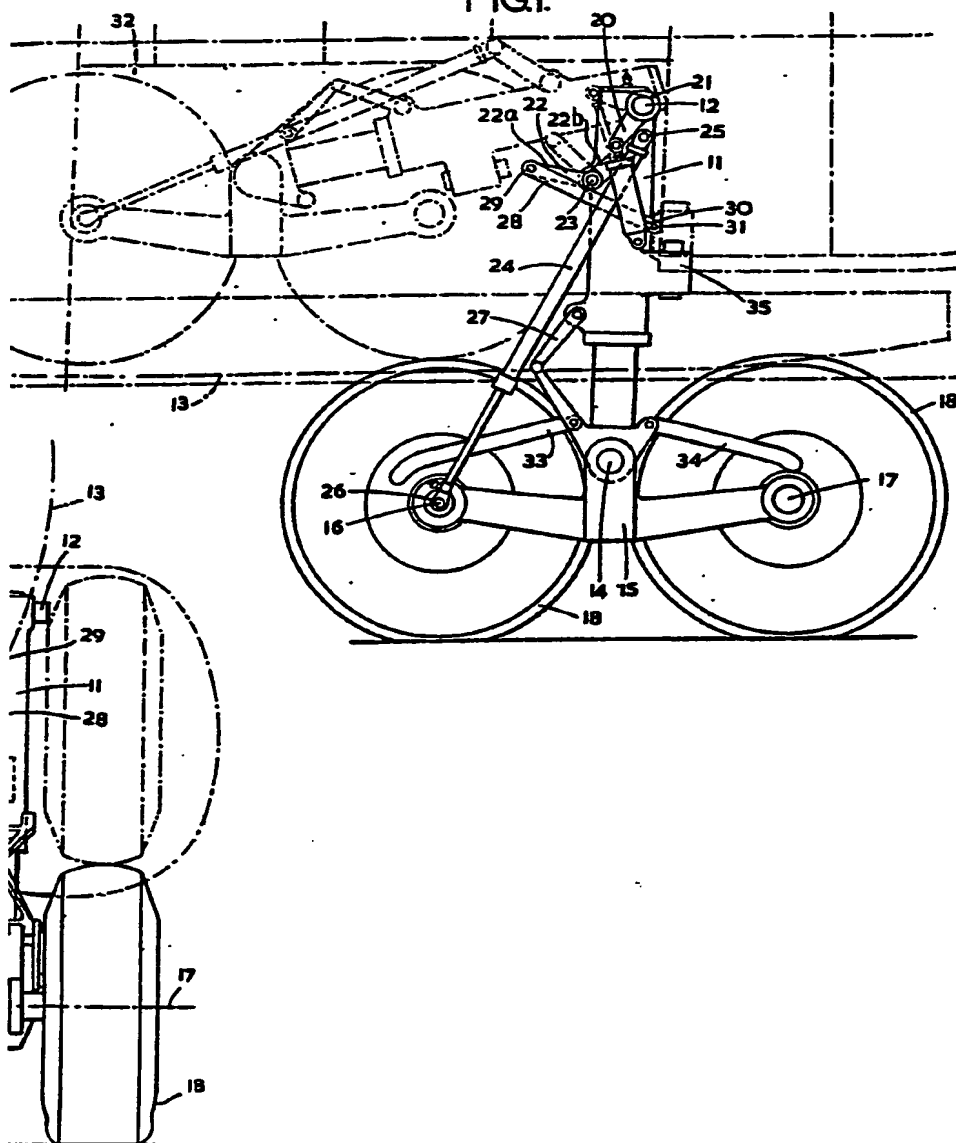


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